

## ABSTRACT

The diversity of information and communication service causes an increasing demand of bandwidth and high speed data access. One medium that can be a solution for this problem is optical fiber. Optical fiber provides huge bandwidth, has a small damping, and able to combine several information signal into one which known as multiplexing system. In optical communication, multiplexing system that commonly use is dense wavelength division multiplexing (DWDM). To make multiplexing process more effective, DWDM need a device that consists an optical filter to perform a selection of certain wavelength known as optical add/drop multiplexer (OADM). There are several optical filters that can be used for OADM device but commonly use an optical filter microring resonator.

This final project discuss about simulation and analysis an optical filter single microring resonator for OADM application on 193 THz frequency. Simulation start from determining the dimension of simulation object such as radius, gap, waveguide material, width and thickness of the waveguide. The simulation was using CST microwave studio 2014 software. Next, analysis process was done after the simulation reach an optimum point. Analysis covers several parameters of single microring resonator such as free spectral range (FSR), bandwidth (FWHM), finesse and Q factor.

Based on analysis and optimization of simulation, a result of optimal single microring resonator parameters value was obtained. An optimal simulation result can reach a high FSR value, a narrow bandwidth, a high finesse value and Q factor, also works on frequency area.

**Keywords : Fiber to the home, optical add/drop multiplexer, microring resonator**